

HEAVY DUTY EXPANSION ANCHOR CE1

- CE option 1 for cracked and uncracked concrete
- Seismic performance category C1 (M8-M10-M12-M16) and C2 (M10-M12-M16)
- 1000 hours of exposure in salt spray test according to EN ISO 9227:2012
- Fire resistance R120
- Complete with nut and washer
- Suitable for dense materials
- Through fastening
- Torque-controlled expansion



USA, Canada and more design values available online.

SERVICE CLASS

SC1 SC2

ATMOSPHERIC CORROSIVITY

C1 C2

MATERIAL



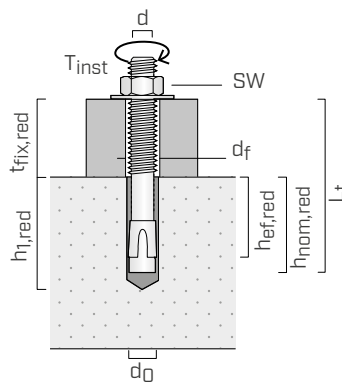
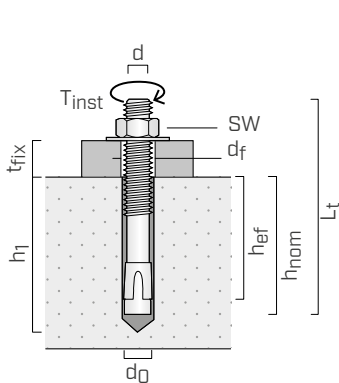
bright zinc-plated carbon steel with zinc-nickel coating



CODES AND DIMENSIONS

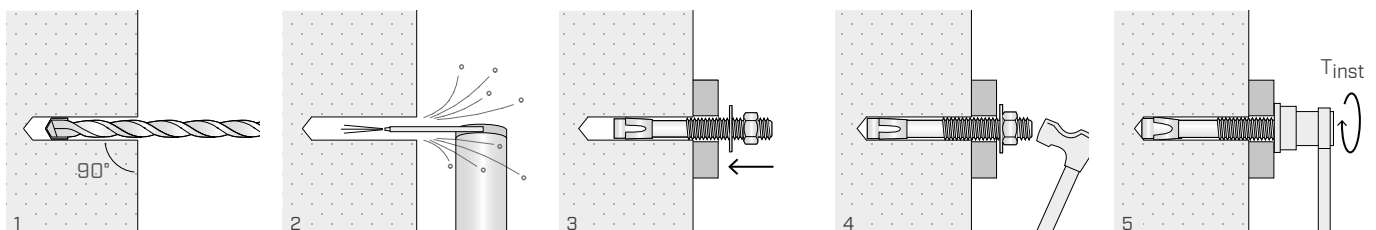
CODE	d = d ₀	L _t	t _{fix} t _{fix,red}	h ₁ h _{1,red}	h _{nom} h _{nom,red}	h _{ef} h _{ef,red}	d _f	SW	T _{inst}	pcs
	[mm] [in]	[mm] [in]	[mm] [in]	[mm] [in]	[mm] [in]	[mm] [in]	[mm] [in]	[mm] [in]	[Nm] [ft.-lbf]	
ABE870	M8 0.32	70 2 3/4	5 0.20	65 2 9/16	55 2 3/16	48 1 7/8	9 0.35	13	20 14	100
ABE895	M8 0.32	95 3 3/4	25 0.98	65 2 9/16	55 2 3/16	48 1 7/8	9 0.35	13	20 14	100
ABE8115	M8 0.32	115 4 1/2	45 1.77	65 2 9/16	55 2 3/16	48 1 7/8	9 0.35	13	20 14	100
ABE10110	M10 0.40	110 4 3/8	30 50 1.18 1.97	80 60 3 1/8 2 3/8	70 50 2 3/4 1 15/16	60 40 2 3/8 1 9/16	12 0.47	17	45 33	50
ABE10140	M10 0.40	140 5 1/2	60 80 2.36 3.15	80 60 3 1/8 2 3/8	70 50 2 3/4 1 15/16	60 40 2 3/8 1 9/16	12 0.47	17	45 33	50
ABE12110	M12 0.48	110 4 3/8	15 0.59	90 3 1/2	81 3 3/16	70 2 3/4	14 0.55	19	60 44	50
ABE12125	M12 0.48	125 4 15/16	30 1.18	90 3 1/2	81 3 3/16	70 2 3/4	14 0.55	19	60 44	50
ABE12145	M12 0.48	145 5 11/16	50 1.97	90 3 1/2	81 3 3/16	70 2 3/4	14 0.55	19	60 44	50
ABE12185	M12 0.48	185 7 1/4	90 3.54	90 3 1/2	81 3 3/16	70 2 3/4	14 0.55	19	60 44	50
ABE16145	M16 0.63	145 5 11/16	30 1.18	110 4 3/8	98 3 7/8	80 3 1/8	18 0.71	24	80 59	25

GEOMETRY

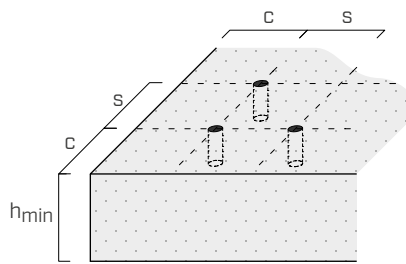


d anchor diameter
d₀ hole diameter in the concrete support
L_t anchor length
t_{fix} maximum fastening thickness
h₁ minimum hole depth
h_{nom} nominal anchoring depth
h_{ef} effective anchoring depth
d_f maximum hole diameter in the element to be fastened
SW wrench size
T_{inst} tightening torque

MOUNTING



INSTALLATION



Spacing and minimum distances			M8	M10	M12	M16
Minimum spacing	s_{min}	[mm]	60	80	110	130
Minimum edge distance	c_{min}	[mm]	70	55	60	90
Minimum thickness of concrete support	h_{min}	[mm]	110	120	140	160
Spacing and critical distances			M8	M10	M12	M16
Critical spacing	$s_{cr,N}^{(1)}$	[mm]	144	$3 \cdot h_{ef}$	210	240
	$s_{cr,sp}^{(2)}$	[mm]	192	240	280	280
Critical edge distance	$c_{cr,N}^{(1)}$	[mm]	72	$1,5 \cdot h_{ef}$	105	120
	$c_{cr,sp}^{(2)}$	[mm]	96	120	140	140

For spacing and distances smaller than the critical ones, strength values have to be reduced depending on the installation parameters.
For h_{ef} values see table of codes and dimensions.

STRUCTURAL VALUES

Valid for a single anchor in thickened C20/25 grade concrete with a thin reinforcing layer when spacing and edge-distance are not limiting parameters.

CHARACTERISTIC VALUES

rod	UNCRACKED CONCRETE				CRACKED CONCRETE			
	tension ⁽³⁾		shear ⁽⁴⁾		tension ⁽³⁾		shear	
	$N_{Rk,p}$ [kN]	γ_{Mp}	$V_{Rk,s}$ [kN]	γ_{Ms}	$N_{Rk,p}$ [kN]	γ_{Mp}	$V_{Rk,s}$ [kN]	γ_M
M8	9	1,5	9,2	1,5	4	1,5	9,2	1,5
M10*	7,5 15		9,1 14,5		5,5 7,5		9,1 14,5	
M12	18		21,1		16		21,1	
M16	26		34		20		34	

*The values refer to the installation of the dowel with the insertion depth value of: $h_{nom}=50mm$ | $h_{nom}=70mm$ respectively.

	Ψ_c incremental factor for $N_{Rk,p}^{(5)}$ uncracked concrete		
	C30/37	C40/50	C50/60
M8	1,12	1,21	1,28
M10*	1,18 1,22	1,32 1,41	1,45 1,58
M12	1,20	1,36	1,50
M16	1,17	1,31	1,42

	Ψ_c incremental factor for $N_{Rk,p}^{(5)}$ cracked concrete		
	C30/37	C40/50	C50/60
M8	1,22	1,41	1,57
M10*	1,04 1,18	1,06 1,32	1,08 1,45
M12	1,22	1,41	1,58
M16	1,19	1,35	1,49

*The values refer to the installation of the dowel with the insertion depth value of: $h_{nom}=50mm$ | $h_{nom}=70mm$ respectively.

NOTES

- ⁽¹⁾ Breakage characteristics for formation of concrete cone for tensile loads.
- ⁽²⁾ Splitting failure mode for tensile loads.
- ⁽³⁾ Pull-out failure mode.
- ⁽⁴⁾ Steel failure mode.
- ⁽⁵⁾ Tensile-strength increment factor (excluding steel failure).

GENERAL PRINCIPLES

- Characteristic values according to ETA-20/0295.
- The design values are obtained from the characteristic values as follows:
 $R_d = R_k / \gamma_M$.
Coefficients γ_M are listed in the table in accordance with the failure characteristics and product certificates.
- For the calculation of anchors with reduced spacing, or too close to the edge, please refer to ETA. Similarly, in case of fastening on concrete-supports with a better-grade, limited thickness or a thick reinforcing layer please see ETA.
- For the design of anchors subjected to seismic loading refer to ETA and to EN 1992-4:2018.
- For the calculation of anchors subjected to fire refer to the ETA and the Technical Report 020.